

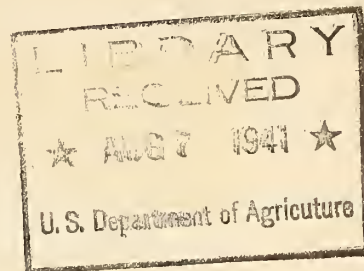
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SOME BENEFITS FROM MODERNIZING COTTON GINS

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Better ginning, by whatever means effected, and to whatever extent practiced, will bring corresponding benefits to the cotton farmer and the cotton ginner. The steps which may be taken to modernize cotton gins are of especial importance in Alabama because so much can be done to improve many older gins in the state.

During the 1940 ginning season, Alabama had 1,117 active gins whose ginnings per plant averaged 694 bales. There were 83 Alabama gins equipped with driers in 1940; that was 7 percent of the State's total number, compared to more than 11 percent for the entire Cotton Belt.

Although we shall not attempt to consider in detail all the various phases of ginning, it is worthwhile to note some of the major benefits from modernizing gins.

Prevention of power waste - a serious item of cost in ginning - is important in Alabama because about one-third of the gins are operated by electric motor. Improvements in fans, piping, pure-seed handling and other elements are, therefore, contributing factors of direct benefit. Of the gins inspected during the past year in Alabama about one-fifth had fair saws and ribs; one-fifth of the brush gins needed brush repairs; and only one-third of the gins examined were operating with loose seed rolls. Most Alabama gins still use small and large drum feeders and have not gone to extractor feeders, which are much more effective in cleaning trashy cotton.

One way in which benefits from modernizing cotton gins may be received is through better ginning with higher gin-saw speeds. All new cotton gin installations in the United States are designed to operate at saw speeds of 600 to 700 revolutions per minute, in order to provide for looser seed rolls and smoother ginned lint. In contrast, saw speeds of 400 to 500 revolutions per minute are still used in many gins of older design. A check on seed-roll densities in about 100 new gins in the Cotton Belt revealed that 96 of those visited were being operated with loose seed rolls and were attaining good ginning, top capacity and cleanly ginned seed at an average saw speed of 660 revolutions per minute.

Tests made at the U. S. Cotton Ginning Laboratory over a period of years on about 100 cottons varying widely in staple length, foreign matter, moisture and other conditions and qualities showed that by increasing the saw speed from 400 to 600 revolutions per minute in ginning with loose seed rolls,

the average increase in ginning capacity amounted to 20 percent for both long and short-staple cottons. There was an average increase in bale weight of 20 pounds for long-staple and 15 pounds for short-staple cotton, and an average increase in bale value of \$2.50 on long-staple and about \$1.50 on short-staple.

Ginners are finding that increased saw-speeds are worthwhile because they pay dividends comparable to those indicated in the Laboratory investigations. The speed of the gin saws of 9 percent of the 500 commercial gins surveyed by the Laboratory in 1940 was stepped up last fall by an average increase of 102 revolutions per minute, or from 440 to 542 revolutions per minute. The cost of the new pulleys needed in making the changes seldom exceeds \$20 per gin stand. When the feeders and picker rollers are driven from the saw shaft in either direct-connected or independent saw-and-brush drives, their speeds will be increased in proportion to saw-speed increases; in direct-connected drives other units may also be involved, such as fans, condenser, distributor, separator and press-pump. In either case, therefore, the feeder pulleys and other machine pulleys must be replaced with larger ones in order to retain the original speeds of everything but the saws. The picker rollers, however, can usually stand increases in saw speeds of 100 revolutions per minute, and in some cases more, without needing larger driven pulleys.

In the gin stands, modernization extends beyond speeding up the saws. It also covers improvements in bearings, brushes or nozzles, metal covers for dividing boards, gin flues, and saws. The use of good gin saws in contrast with saws in poor condition has shown a gain of as much as \$2.00 per bale with long staple cottons, as well as an average decrease in ginning time of 30 percent on long-staple and 20 percent on short-staple cottons. Losses in the monetary value of the ginned lint from using brushes in poor condition have ranged, on the average, from 80 cents on short staples to as much as \$1.50 with damp long-staple cottons. Bale value losses from poor airblast nozzles improperly operated in tests averaged \$1.00 per bale on long-staple and 80 cents on short-staple cotton ginned in a moist condition.

The opportunities today for getting additional years of service from old gin stands appear better than ever before. Self-aligning ball bearings are available for eliminating vibration, lubrication and operation troubles. Brushes now available from the factories and independent sources are in a number of ways superior to those of 10 years ago, and the improvements devised for air-blast gins are often applicable to earlier models. To attain loose-roll ginning with greater capacity should be the objective in gin stand modernization. Replacement of older forms of huller ribs with latest types is advisable in many instances. Special repairs of ribs, seed boards, rib rails, and other collateral parts have recently put many old gin stands in condition to give excellent service. The doffing systems of both the brush and air-blast gins are readily repaired and in older forms of gin stands can be improved with metal covers and in other ways.

Modernization of cotton gins implies an improvement in seed-handling systems or methods, to maintain the purity of seed, which is of special benefit to the cotton farmer. Two-story-gins, with seed screws, can have hinged bottoms on the seed troughs to give quick cleanout, and simple arrangements of existing drive belts can often be made so that the conveyor is reversible for delivery of pure seed to a sacker at one end of the trough or of ordinary seed to the mill-run blower at the other end. Other economical methods

of insuring pure seed involve the use of endless belts and improved blowing devices. The whole question of seed handling ties in with the latest demands from farmers for combined delinting and seed treatment, which in many communities is proving profitable to the ginner and farmer alike. Some ginner have made use of 106-saw delinters of the type recently discarded from modernized oil mills and are able to delint about two tons of seed per day with only 10 horsepower per delinter stand. One of the latest pure-seed handling systems of cotton gins uses approximately only one horsepower per gin stand with a self-cleaning belt and 4-inch pipes to convey seed up to 200 feet from the gin. These developments are representative of recent power-saving methods coming into use.

Much has been said at previous annual meetings of your association to emphasize the benefits, such as better quality, better cleaning, smoother ginning and loose seed roll operations, which are possible with cotton driers. It is quite evident that the addition of a drier to the ginning equipment, or the application of heated air to existing cleaning equipment, affords greatly improved ginning performance. Airline cleaners can be converted into airline driers at low cost; some forms of extractor-cleaner-feeders which already have drying connections can be cheaply piped up to new sources of heat, and replacement of old types of feeders with new extractor-cleaner-feeders may aid in a sweeping simplification of the entire ginning outfit and a reduction in power consumption, along with it.

From ginner's reports to the Laboratory during a three-year survey, 1938-1940, of commercial gins across the Cotton Belt, it was estimated that the driers in operation handled an average of more than one million bales a year; 40 percent of the cotton handled by gins equipped with driers was reported to have been green, damp or wet, and in most cases such cotton was conditioned satisfactorily. It has been the general observation of operating ginner's, making these reports, that the use of their driers increased ginning capacity by an average of 25 percent on moist cottons, and by about 4 percent on dry ones. Upon the basis of such reports, it was estimated that the bale value increased by an average of \$4.50 with green, damp or wet cotton, and by more than \$1 with dry cotton, as a combined result of conditioning, cleaning and improving the grade of the cotton.

In the drying operations thus reported, fuel costs for all sources of heat averaged 14 cents per bale, ranging from 16 cents average for steam down to 7 cents average for engine waste-heat recovery apparatus. It is now evident that furnaces consuming butane and natural gas and other furnaces, both direct and indirect-fired, are becoming the most popular sources of heat.

In surveying about 100 of the new gins installed in 1940 in the Cotton Belt, or about two-thirds of all the new gins, it was noted that all-steel presses were installed in 81% of them, and that two-thirds of these were of the single-story, down-packing type.

The pressing operation is vital to the entire cotton industry and offers many benefits in return for modernization which results in delivering to the consumer bales of better appearance and condition and in providing higher-density packaging and its attendant advantages in storage, handling and transportation. Metal bindings or trimmings for wooden press boxes are proving very satisfactory; new 9-1/2-inch rams for replacing smaller ones

